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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/448,223	11/23/1999	Steven Dardinski	0102314-00054	4797

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EXAMINER

INGBERG, TODD D

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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7590 10/08/2003

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EXAMINER

INGBERG, TODD D

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# Office Action Summary

Application No.

09/448,223

Applicant(s)

DARDINSKI ET AL.

Examiner

Todd Ingberg

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-134 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-134 is/are rejected.
- 7) ☐ Claim(s) 84 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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### **DETAILED ACTION**

Claims 1 - 134 have been examined.

#### ***Continuation Information***

1. The continuation information is noted. Effective filing date remains November 23, 1999.

#### ***Information Disclosure Statement***

2. The Applicant has submitted a large IDS. On initial inspection the Examiner did not see the relevance of the documents. If the Applicant feels particular documents are relevant to the invention please indicate the specific document(s).

#### ***Claim Objections***

3. Claim 84 is objected to because of the following informalities: it is dependent on itself. Examiner presumed Applicant meant it was dependent on claim 83. Appropriate correction is required.

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***Common Knowledge of Object Oriented Technology***

4. The following terms and concepts are inherent in object oriented technology.

***Classes***

***Objects***

***Inheritance*** (link representing relationships)

***Aggregation***

***Child/parent (derived/base) relationship***

***Cardinality*** (description of optional relationship)

***Attributes***

***Methods***

***Messaging***

These basic terms should easily be recognizable to a Person Having Ordinary Skill In The Art (PHOSITA) at the time of invention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1 - 134 are rejected under 35 U.S.C. 102(a) as being anticipated by Real-Time Innovations, **ControlShell** version 6.0 User's Manual published January 1999.

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**Claim 1**

Apparatus for configuring a process control system, the apparatus comprising: a plurality of objects, each object representing an entity, and each object being associated with an object type, at least one object ("connection" object) identifying permissible combinations of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the connection object.

**Examiner's Response**

ControlShell is an object oriented software development environment for programming/configuring control systems (overview Chapters 1 - 4). Where linking objects (3-23) and defined types (3-25) with relationships is inherent in Object modeling. Objects are made of objects (3.4.1 - decompose into smaller objects). The model is verified (page 1-13, 8-22 and 9-36 to 9-39)

**Claim 2**

Apparatus according to claim 1, wherein the connection object specifies a role that one or more object types may serve in a relationship, the roles including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

In Claim 1 inheritance and pages 13-33.

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**Claim 3**

Apparatus according to claim 2, wherein one or more object types are associated in a hierarchical relationship, and wherein the apparatus validates a potential relationship between two objects via the existence of a connection object identifying as permissible a relationship between any of (i) object types associated with those two objects, and (ii) object types that are hierarchically related to the object types associated with those two objects.

**Examiner's Response**

See the rejection for claim 1.

**Claim 4**

Apparatus according to claim 1, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between objects.

**Examiner's Response**

See the rejection for claim 1.

**Claim 5**

Apparatus according to claim 4, wherein the connection object specifies a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

See the rejection for claim 1.

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**Claim 6**

Apparatus according to claim 5, wherein the connection object identifies, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 1.

**Claim 7**

Apparatus according to claim 5, wherein the connection object identifies, for an object that may serve in a child role, any of a weight and other quantitative attribute (collectively, "weight ") associated with that object, and the connection object identifies, for an object that may serve in a parent role, a capacity weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 1. The inheritance structure of object model meets the weighted term of the Specification.

**Claim 8**

Apparatus according to claim 1, wherein the source/sink relationship is indicative of a peer-to-peer relationship between objects.

**Examiner's Response**



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The Applicant has claimed messaging between objects. Messaging in dataflow among objects pages 3-10 to 3-16.

**Claim 9**

Apparatus according to claim 8, wherein the connection object specifies a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See rejection for claim 1.

**Claim 10**

Apparatus according to claim 9, wherein the connection object identifies, for an object that may serve in a source role, any of a minimum and maximum number of relationships that object may support with objects that serve in a sink role.

**Examiner's Response**

Limit on number of relationships page 1-13 box 5.

**Claim 11**

Apparatus according to claim 9, wherein the connection object identifies, for an object that may serve in a sink role, any of a minimum and maximum number of relationships that object may support with objects that serve in a source role.

**Examiner's Response**

Limit on number of relationships page 1-13 box 5.

**Claim 12**

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Apparatus for configuring a process control system, the apparatus comprising: a plurality of objects, each object representing an entity, and each object being associated with an object type, at least one object ("connection" object) identifying permissible combinations of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus at least initially validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the connection object, the connection object identifying validated relationships established between objects.

**Examiner's Response**

See the rejection for claim 1.

**Claim 13**

Apparatus according to claim 12, wherein the connection object specifies a role that an object serves in a relationship with any of itself and another object, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 2.

**Claim 14**

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Apparatus according to claim 12, wherein an object represents an entity within any of (i) a controlled system, (ii) the control system, (iii) a control level hierarchy, and (iv) the apparatus for configuring the control system.

**Examiner's Response**

Page 1-11.

**Claim 15**

Apparatus according to claim 14, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

Chapter 5 ControlShell Editor - page 5-33 graphical display.

**Claim 16**

Apparatus according to claim 12, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between objects.

**Examiner's Response**

See the rejection for claim 4.

**Claim 17**

Apparatus according to claim 16, wherein the connection object specifies a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

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See the rejection for claim 5.

**Claim 18**

Apparatus according to claim 17, wherein the connection object identifies, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 6.

**Claim 19**

Apparatus according to claim 17, wherein the connection object identifies, for an object that may serve in a child role, any of a weight and other quantitative attribute (collectively, "weight") associated with that object, and the connection object identifies, for an object that may serve in a parent role, a capacity in weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 7.

**Claim 20**

Apparatus according to claim 12, wherein the source/sink relationship is indicative of a peer-to-peer relationship between objects.

**Examiner's Response**

See the rejection for claim 8.

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**Claim 21**

Apparatus according to claim 20, wherein the connection object specifies a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 9.

**Claim 22**

Apparatus according to claim 21, wherein the connection object identifies, for an object that may serve in a source role, any of a minimum and maximum number of relationships that object may support with objects that serve in a sink role.

**Examiner's Response**

See the rejection for claim 10.

**Claim 23**

Apparatus according to claim 21, wherein the connection object identifies, for an object that may serve in a sink role, any of a minimum and maximum number of relationships that object may support with objects that serve in a source role.

**Examiner's Response**

See the rejection for claim 11.

**Claim 24**

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Apparatus for configuring a process control system, the apparatus comprising: one or more objects, each object representing an entity and each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, at least one object ("second connection" object) identifying permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus establishing a relationship between one or more parameters of one or more objects by comparing the types of those parameters with the types identified by the second connection object.

**Examiner's Response**

See rejection for claim 1.

**Claim 25**

Apparatus according to claim 24, wherein the apparatus establishes relationships between the parameters of objects, which objects have been selected by a user.

**Examiner's Response**

See relationships as per rejection for claim 1.

**Claim 26**

Apparatus according to claim 25, wherein the apparatus establishes relationships between the parameters of objects, which objects that have been selected by the user for potential relationship and between which objects such potential relationship has been validated.

**Examiner's Response**

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See rejection for claim 1.

**Claim 27**

Apparatus according to claim 26, each object is associated with an object type, and wherein the apparatus validates a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by a first connection object.

**Examiner's Response**

Validation as per claim 1.

**Claim 28**

Apparatus according to claim 24, wherein the second connection object specifies a role that one or more parameter types may serve in a relationship, the roles including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See rejection of claim 1.

**Claim 29**

Apparatus according to claim 24, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See rejection of claim 1.

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**Claim 30**

Apparatus according to claim 24, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See rejection as per claim 8. Messaging invokes methods (getters and setters) inherent in Object Technology.

**Claim 31**

Apparatus according to claim 30, wherein the second connection object specifies a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 9.

**Claim 32**

Apparatus according to claim 31, wherein the second connection object identifies, for a parameter that may serve in a source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See the rejection for claim 10.

**Claim 33**



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Apparatus according to claim 31, wherein the second connection object identifies, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

. See the rejection for claim 11.

**Claim 34**

Apparatus for configuring a process control system, the apparatus comprising: one or more objects, each object representing an entity and each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, at least one object ("second connection" object) identifying permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus establishing a relationship between one or more parameters of one or more objects by comparing the types of those parameters with the, types identified by the second connection object, the second connection object identifying validated relationships established between parameters.

**Examiner's Response**

See rejection of claim 1.

**Claim 35**

Apparatus according to claim 34, wherein the second connection object specifies a role that a parameter serves in a relationship with any of itself and another parameter, the roles

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including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

As per the rejection of claim 1.

**Claim 36**

Apparatus according to claim 34, wherein an object represents an entity within any of

- (i) a controlled system,
- (ii) the control system,
- (iii) a control level hierarchy, and
- (iv) the apparatus for configuring the control system.

**Examiner's Response**

See the rejection as per claim 1.

**Claim 37**

Apparatus according to claim 36, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

Chapter 8 and page 1-4 Stethoscope CsdBase connection.

**Claim 38**

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Apparatus according to claim 37, wherein each parameter has one or more attributes, and wherein the attributes of a parameter define any of the following with the respect to the characteristic to which the parameter pertains: name, grouping, display label, data type, behavior help information, edit type, data value range, data value, formula definition, and display format.

**Examiner's Response**

Chapter 4 provides a tour of ControlShell. Parameter overview is on page 4-3 and shown in figure 4-2. The definitions of each parameter is on the parameter block (sam, sco, fsm, msg). Help, page 4-10 to 4-11, Online documentation.

**Claim 39**

Apparatus according to claim 34, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

Page 4-3 shows the parameters in the figure 4-2. The number of parameters by type are visible such as (sam (5) sco (3) fsm (5) and msg (1).

**Claim 40**

Apparatus according to claim 34, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 41**

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Apparatus according to claim 40, wherein the second connection object specifies a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection as per claim 1.

**Claim 42**

Apparatus according to claim 41, wherein the second connection object identifies, for a parameter that may serve in a source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See rejection of claim 10.

**Claim 43**

Apparatus according to claim 41, wherein the second connection object identifies, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

See rejection of claim 10.

**Claim 44**

Apparatus for configuring a process control system, the apparatus comprising:  
one or more objects, each representing an entity and each being associated with an object type,

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each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, at least one object ("first connection" object) identifying permissible combinations of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, at least one object ("second connection" object) identifying permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the first connection object, and the apparatus establishing a relationship between one or more parameters of one or more objects for which a potential relationship has been validated, the relationship between parameters being established by comparing the types of those parameters with the types identified by the second connection object.

**Examiner's Response**

See the rejection for claim 1 object modeling is not limited to connecting a single object.

**Claim 45**

Apparatus according to claim 44, wherein the apparatus establishes validates a potential relationship between objects selected by a user.

**Examiner's Response**

See the rejection for claim 25.

**Claim 46**

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Apparatus according to claim 44, wherein the first connection object specifies a role that one or more object types may serve in a relationship, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship, and the second connection object specifies a role that one or more parameter types may serve in a relationship, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 28.

**Claim 47**

Apparatus according to claim 44, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See the rejection for claim 29.

**Claim 48**

Apparatus according to claim 47, wherein the first connection object specifies a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

See rejection of claim 1.

**Claim 49**

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Apparatus according to claim 48, wherein the first connection object identifies, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See rejection of claim 1.

**Claim 50**

Apparatus according to claim 48, wherein the first connection object identifies, for an object that may serve in a child role, any of weight and other quantitative attribute (collectively, "weight") associated with that object, and the first connection object identifies, for an object that may serve in a parent role, a capacity in weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See rejection of claim 1.

**Claim 51**

Apparatus according to claim 44, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 52**

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Apparatus according to claim 51, wherein the second connection object specifies a role that an object may serve in a source/sink relationship, the roles including any of a source role a sink role.

**Examiner's Response**

See the rejection for claim 31.

**Claim 53**

Apparatus according to claim 52, wherein the second connection object identifies, for, parameter that may serve in a source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See the rejection for claim 32.

**Claim 54**

Apparatus according to claim 52, wherein the second connection object identifies, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

See the rejection for claim 33.

**Claim 55**

Apparatus according to claim 44, wherein the first connection object identifying validated relationships established between object and the second connection object identifying validated relationships established between parameters.



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**Examiner's Response**

See the rejection for claim 26.

**Claim 56**

Apparatus according to claim 44, wherein an object represents an entity within any of

- (i) a controlled system,
- (ii) the control system,
- (iii) a control level hierarchy, and
- (iv) the apparatus for configuring the control system.

**Examiner's Response**

See the rejection for claim 14.

**Claim 57**

Apparatus according to claim 56, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

See the rejection for claim 15.

**Claim 58**

Apparatus according to claim 57, wherein each parameter has one or more attributes, and wherein the attributes of a parameter define any of the following with the respect to the characteristic to

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which the parameter pertains: name, grouping, display label, data type, behavior, help information, edit type, data value range, data value, formula definition, and display format.

**Examiner's Response**

See rejection of claim 38.

**Claim 59**

a method for configuring a control system, the method comprising the steps of representing a plurality of entities with objects, each being associated with an object type, identifying, with at least one object ("connection" object), permissible combinations of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the connection object.

**Examiner's Response**

See the rejection for claim 1.

**Claim 60**

a method according to claim 59, comprising the step of specifying, with the connection object, a role that one or more object types may serve in a relationship, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 2.

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**Claim 61**

a method according to claim 60, comprising the steps of associating one or more objects in a hierarchical relationship, and wherein validating a potential relationship between two objects via the existence of a connection object identifying as permissible a relationship between any of

- (i) object types associated with those two objects, and
- (ii) object types that are hierarchically related to the object types associated with those two objects.

**Examiner's Response**

See the rejection for claim 1.

**Claim 62**

a method according to claim 59, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between objects.

**Examiner's Response**

See the rejection for claim 4.

**Claim 63**

a method according to claim 62, comprising the step of specifying, with the connection object, a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

See the rejection for claim 5.

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**Claim 64**

a method according to claim 63, comprising the step of identifying, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 6.

**Claim 65**

a method according to claim 63, comprising the steps of identifying, for an object that may serve in a child role, any of a weight and other quantitative attribute (collectively, "weight") associated with that object, and identifying, for an object that may serve in a parent role, a capacity in weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 7.

**Claim 66**

a method according to claim 59, wherein the source/sink relationship is indicative of a peer-to-peer relationship between objects.

**Examiner's Response**

See the rejection for claim 8.

**Claim 67**

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a method according to claim 66, comprising the step of specifying, with the connection object, a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 9.

**Claim 68**

a method according to claim 67, comprising the step of identifying, for an object that may serve in a source role, any of a minimum and maximum number of relationships that object may support with objects that serve in a sink role.

**Examiner's Response**

See the rejection for claim 10.

**Claim 69**

a method according to claim 67, comprising the step of identifying, for an object that may serve in a sink role, any of a minimum and maximum number of relationships that object may support with objects that serve in a source role.

**Examiner's Response**

See the rejection for claim 11.

**Claim 70**

a method for configuring a control system, the method comprising the steps of: representing a plurality of entities with objects, each being associated with an object type, identifying, with at

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least one object ("connection" object), permissible combinations of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, at least initially validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the connection object, identifying, with the connection object, validated relationships established between objects.

**Examiner's Response**

See the rejection for claim 1.

**Claim 71**

a method according to claim 70, comprising the step of specifying, with the connection object, a role that an object serves in a relationship with any of itself and another object, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 2.

**Claim 72**

a method according to claim 70, wherein an object represents an entity within any of (i) a controlled system, (ii) the control system, (iii) a control level hierarchy, and (iv) an apparatus for configuring the control system.

**Examiner's Response**

See the rejection for claim 14.

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**Claim 73**

a method according to claim 72, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

See the rejection for claim 15.

**Claim 74**

a method according to claim 70, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between objects.

**Examiner's Response**

See the rejection for claim 4.

**Claim 75**

a method according to claim 74, comprising the step of specifying, with the connection object, a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

See the rejection for claim 5.

**Claim 76**

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a method according to claim 75, comprising the step of identifying, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 6.

**Claim 77**

a method according to claim 75, comprising the steps of identifying, for an object that may serve in a child role, any of a weight and other quantitative attribute (collectively, "weight") associated with that object, and identifying, for an object that may serve in a parent role, a capacity in weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See the rejection for claim 7.

**Claim 78**

a method according to claim 70, wherein the source/sink relationship is indicative of a peer-to-peer relationship between objects.

**Examiner's Response**

See the rejection for claim 8.

**Claim 79**



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a method according to claim 78, comprising the step of specifying, with the connection object, a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 9.

**Claim 80**

a method according to claim 79, comprising the step of identifying, for an object that may serve in a source role, any of a minimum and maximum number of relationships that object may support with objects that serve in a sink role.

**Examiner's Response**

See the rejection for claim 10.

**Claim 81**

a method according to claim 79, comprising the step of identifying, for an object that may serve in a sink role, any of a minimum and maximum number of relationships that object may support with objects that serve in a source role.

**Examiner's Response**

See the rejection for claim 11.

**Claim 82**

a method for configuring a control system, the method comprising the steps of: representing one or more entities with objects, each object being associated with one or more parameters that

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pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, identifying, with at least one object ("second connection" object), permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, establishing a relationship between one or more parameters of one or more objects by comparing the types of those parameters with the types identified by the second connection object.

**Examiner's Response**

See the rejection for claim 1 - object modeling is not limited to connecting one object.

**Claim 83**

a method according to claim 82, comprising the step of establishing relationships between the parameters of objects that have been selected by a user.

**Examiner's Response**

See the rejection for claim 25.

**Claim 84**

a method according to claim 84, comprising the step of establishing relationships between the parameters of objects that have been selected by the user for potential relationship and between which such potential relationship has been validated.

**Examiner's Response**

See the rejection for claim 26.

**Claim 85**

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a method according to claim 84, wherein each object is associated with an object type, the method comprising the step of establishing a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by a first connection object.

**Examiner's Response**

See the rejection for claim 27.

**Claim 86**

a method according to claim 82, comprising the step of specifying, with the second connection object, a role that one or more parameter types may serve in a relationship, the roles including  
(i) any of source and sink in a source/sink relationship, and  
(ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 28.

**Claim 87**

a method according to claim 82, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See the rejection for claim 29.

**Claim 88**

a method according to claim 82, wherein the source/sink relationship is indicative of a

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peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 89**

a method according to claim 88, comprising the step of specifying, with the second connection object, a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 31.

**Claim 90**

a method according to claim 89, comprising the step of identifying, for a parameter that may serve in source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See the rejection for claim 32.

**Claim 91**

a method according to claim 89, comprising the step of identifying, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

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See the rejection for claim 33.

**Claim 92**

a method for configuring a control system, the method comprising the steps of: representing one or more entities with objects, each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, identifying, with at least one object ("second connection" object), permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, establishing a relationship between one or more parameters of one or more objects by comparing the types of those parameters with the types identified by the second connection object, identifying, with the second connection object, validated relationships established between parameters.

**Examiner's Response**

See the rejection for claim 34.

**Claim 93**

a method according to claim 92, comprising the step of specifying, with the second connection object, a role that a parameter serves in a relationship with any of itself and another parameter, the roles including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

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See the rejection for claim 35.

**Claim 94**

a method according to claim 92, wherein an object represents an entity within any of

- (i) a controlled system,
- (ii) the control system,
- (iii) a control level hierarchy, and
- (iv) an apparatus for configuring the control system.

**Examiner's Response**

See the rejection for claim 36.

**Claim 95**

a method according to claim 94, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

See the rejection for claim 37.

**Claim 96**

a method according to claim 95, wherein each parameter has one or more attributes, and wherein the attributes of a parameter define any of the following with the respect to the characteristic to which the parameter pertains: name, grouping, display label, data type, behavior, help information, edit type, data value range, data value, formula definition, and display format.

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**Examiner's Response**

See the rejection for claim 38.

**Claim 97**

a method according to claim 92, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See the rejection for claim 39.

**Claim 98**

a method according to claim 92, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 24.

**Claim 99**

a method according to claim 98, comprising the step of specifying, with the second connection object, a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See the rejection for claim 41.

**Claim 100**

a method according to claim 99, comprising the step of identifying, for a parameter that

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may serve in a source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See the rejection for claim 42.

**Claim 101**

a method according to claim 99, comprising the step of identifying, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

See the rejection for claim 43.

**Claim 102**

a method for configuring a control system, the method comprising the steps of: representing one or more entities with objects, each being associated with an object type, each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, identify, at least one object ("first connection" object), permissible combination of object types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, identifying, with at least one object ("second connection" object), permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship,



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validating a potential relationship between objects by comparing the object types with which they are associated with permissible relationships identified by the first connection object, and establishing a relationship between one or more parameters of one or more objects for which a potential relationship has been validated, the relationship between parameters being established by comparing the types of those parameters with the types identified by the second connection object.

**Examiner's Response**

See the rejection for claim 1 - object modeling is not limited to connection one object.

**Claim 103**

a method according to claim 102, comprising the step of establishing validates a potential relationship between objects selected by a user.

**Examiner's Response**

See validation of claim 1.

**Claim 104**

a method according to claim 102, comprising the steps of specifying, with the first connection object, a role that one or more object types may serve in a relationship, the roles including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship, and

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specifying, with the second connection object, a role that one or more parameter types may serve in a relationship, the roles including (i) any of source and sink in a source/sink relationship, and (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See rejection of claim 1.

**Claim 105**

a method according to claim 102, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See rejection of claim 1.

**Claim 106**

a method according to claim 105, comprising the step of specifying, with the first connection object, a role that an object may serve in a parent/child relationship, the roles including any of a parent role and a child role.

**Examiner's Response**

See rejection of claim 1.

**Claim 107**

a method according to claim 106, comprising the step of identifying, for an object that may serve in a parent role, a capacity of that object to support relationships with objects that serve in a child role.

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**Examiner's Response**

See rejection of claim 1.

**Claim 108**

a method according to claim 106, wherein identifying, for an object that may serve in a child role, any of a weight and other quantitative attribute (collectively, "weight") associated with that object, and identifying, for an object that may serve in a parent role, a capacity in weight of that object to support relationships with objects that serve in a child role.

**Examiner's Response**

See rejection of claim 1.

**Claim 109**

a method according to claim 102, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 110**

a method according to claim 109, comprising the step of specifying, with the second connection object, a role that an object may serve in a source/sink relationship, the roles including any of a source role and a sink role.

**Examiner's Response**

See rejection of claim 1.

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**Claim 111**

a method according to claim 110, comprising the step of identifying, for a parameter that may serve in a source role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a sink role.

**Examiner's Response**

See rejection of claim 10.

**Claim 112**

a method according to claim 110, comprising the step of identifying, for a parameter that may serve in a sink role, any of a minimum and maximum number of relationships that parameter may establish with parameters that serve in a source role.

**Examiner's Response**

See rejection of claim 10.

**Claim 113**

a method according to claim 102, wherein identifying, with the first connection object, validated relationships established between objects, and identifying, with the second connection object, validated relationships established between parameters.

**Examiner's Response**

See rejection of claim 1.

**Claim 114**

a method according to claim 102, wherein an object represents an entity within any of

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- (i) a controlled system,
- (ii) the control system,
- (iii) a control level hierarchy, and
- (iv) an apparatus for configuring the control system.

**Examiner's Response**

See rejection of claim 1.

**Claim 115**

a method according to claim 114, wherein an entity includes any of a field device, control processor, block, loop, compound, historian, object type category, display placeholder, graphical display entity, and report.

**Examiner's Response**

See rejection of claim 15.

**Claim 116**

a method according to claim 115, wherein each parameter has one or more attributes, and wherein the attributes of a parameter define any of the following with the respect to the characteristic to which the parameter pertains: name, grouping, display label, data type, behavior, help information, edit type, data value range, data value, formula definition, and display format.

**Examiner's Response**

See rejection of 38

**Claim 117**

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Apparatus for configuring a process control system, the apparatus comprising: one or more objects, each object representing an entity and each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, at least one object ("second connection" object) identifying permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, the apparatus validating a relationship between one or more parameters of one or more objects by comparing the types of those parameters with permissible relationships identified by the second connection object.

**Examiner's Response**

See the rejection for claim 1. Object model not limited to modeling and connection a single object as per page 4-2 figure 4.1.

**Claim 118**

Apparatus according to claim 117, wherein the apparatus establishes relationships between the parameters selected by a user through any of a drag-and-drop operation, menu operation, or other operation.

**Examiner's Response**

See pages 5-19 - 5-23 (drag and paste and other features)

**Claim 119**

Apparatus according to claim 117, wherein the second connection object specifies a role that one or more parameter types may serve in a relationship, the roles including

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- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 28.

**Claim 120**

Apparatus according to claim 117, wherein the parent/child relationship is indicative of any of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See the rejection for claim 29.

**Claim 121**

Apparatus according to claim 117, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 122**

a method for configuring a control system, the method comprising the steps of: representing one or more entities with objects, each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, identifying, with at least one object ("second connection" object), permissible combinations of parameter types that can form any of a parent/child relationship, a

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source/sink relationship, and other relationship, validating a relationship between one or more parameters of one or more objects by comparing the types of those parameters with permissible relationships identified by the second connection object.

**Examiner's Response**

See the rejection for claim 1.

**Claim 123**

Method according to claim 122, comprising establishing relationships between parameters selected by a user through any of a drag-and-drop operation, menu operation, or other operation.

**Examiner's Response**

See the rejection for claim 118.

**Claim 124**

Method according to claim 122, comprising specifying, with the second connection object, a role that one or more parameter types may serve in a relationship, the roles including

- (i) any of source and sink in a source/sink relationship, and
- (ii) any of parent and child in a parent/child relationship.

**Examiner's Response**

See the rejection for claim 28.

**Claim 125**

Method according to claim 122, wherein the parent/child relationship is indicative of any



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of a hierarchical and a containment relationship between parameters.

**Examiner's Response**

See the rejection for claim 29.

**Claim 126**

Method according to claim 122, wherein the source/sink relationship is indicative of a peer-to-peer relationship between parameters.

**Examiner's Response**

See the rejection for claim 30.

**Claim 127**

Apparatus for configuring a process control system, the apparatus comprising: one or more objects, each object representing an entity and each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, at least one object ("second connection" object) identifying permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, and the apparatus responding to establishment of a primary relationship ("master" relationship) between one or more parameters of one or more objects by establishing one or more secondary relationships ("slave" relationships) between parameters of those objects.

**Examiner's Response**

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The limitations of claim 1 teach the present limitations. The master/slave relationship where the relationship is automatically updated or destroyed when the corresponding master connection is updated or destroyed. The rejection is directed toward the multiple hierarchical link among objects. Where once the link is broken the objects remain but without the relationship the connections of the modeling tool no longer permit the normal actions permitted by the connection. Chapter 3 provides an overview of the methodology of the connections and interfaces among COGs.

**Claim 128**

Apparatus according to claim 127, wherein the slave relationships are established between parameters related to those defining the master relationship.

**Examiner's Response**

Parameters are defined as per Chapter 4 specifically page 4-3 Figure 4.2 shows the parameters.

**Claim 129**

Apparatus according to claim 128, wherein the apparatus establishes the master relationship between the parameters selected by a user through any of a drag-and-drop operation, menu operation, or other operation.

**Examiner's Response**

See the rejection for claim 118.

**Claim 130**

Apparatus according to claim 128, wherein the apparatus any of modifies and destroys a slave relationship upon any of modification and destruction of a corresponding master relationship.

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**Examiner's Response**

See the rejection for claim 127.

**Claim 131**

Method for configuring a control system, the method comprising the steps of representing one or more entities with objects, each object being associated with one or more parameters that pertain to characteristics of the entity represented by the object, each parameter being associated with a parameter type, identifying, with at least one object ("second connection" object), permissible combinations of parameter types that can form any of a parent/child relationship, a source/sink relationship, and other relationship, responding to establishment of a primary relationship ("master" relationship) between one or more parameters of one or more objects by establishing one or more secondary relationships ("slave" relationships) between parameters of those objects.

**Examiner's Response**

See the rejection for claim 127. Object modeling is no limited to definition of a single object (page 4-2, Figure 4.1).

**Claim 132**

Method according to claim 131, comprising the step of establishing slave relationships between parameters related to those defining the master relationship.

**Examiner's Response**

See rejection for claim 128.

**Claim 133**

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Method according to claim 132, comprising the step of establishing the master relationship between the parameters selected by a user through any of a drag-and-drop operation, menu operation, or other operation.

**Examiner's Response**

See rejection for 118.

**Claim 134**

Method according to claim 132, comprising the step of any of modifying and destroying a slave relationship upon any of modification and destruction of a corresponding master relationship.

**Examiner's Response**

See rejection for claim 127.

***Correspondence Information***

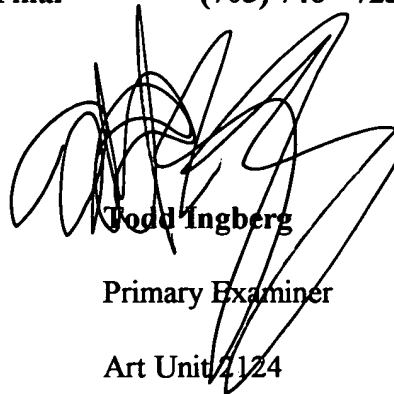
7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to **Todd Ingberg** whose telephone number is **(703) 305-9775**. The Examiner is working a Maxi-Flex schedule and can be reached Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the **Examiner's Supervisor, Kakali Chaki** be reached at **(703)305-9662**. Any response to this office action should be mailed to: **Director of Patents and Trademarks Washington, D.C. 20231**, or **Hand-delivered** responses should be brought to **Crystal Park II, 2121 Crystal Drive Arlington, Virginia, (Receptionist located on the fourth floor)**, or **faxed**. The following **fax numbers** apply:

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